

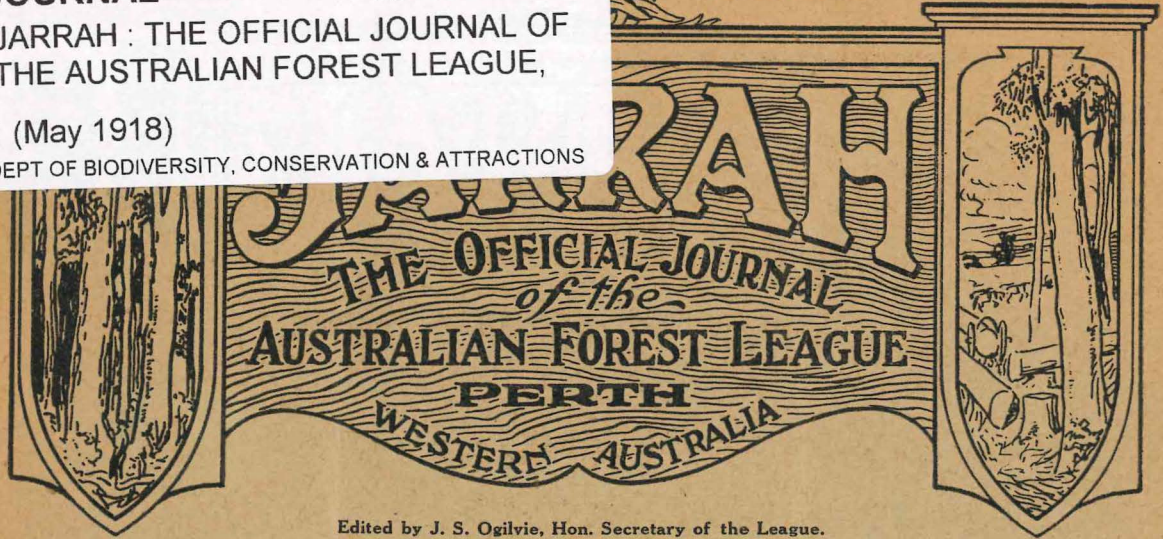


# JOURNAL

## JARRAH : THE OFFICIAL JOURNAL OF THE AUSTRALIAN FOREST LEAGUE,

1 (May 1918)

DEPT OF BIODIVERSITY, CONSERVATION & ATTRACTIONS



Edited by J. S. Ogilvie, Hon. Secretary of the League.

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Edited by J. S. Ogilvie, Hon. Secretary of the League.

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## Jarrah

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Correspondence and contributions on forestry matters are invited from members of the League and others interested in forestry and cognate subjects. "Jarrah" has no politics. It knows only forests and forestry, but it will gladly welcome the assistance of patriotic politicians in its propaganda. Questions on matters relating to forestry are invited and will be answered, and suggestions for increasing the usefulness of "Jarrah" will be carefully considered. No responsibility is accepted for opinions expressed or conclusions arrived at by contributors or correspondents.

All communications should be addressed to:

THE EDITOR, "JARRAH,"  
WEST AUSTRALIAN CHAMBERS,  
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PERTH.

### Why "Jarrah"?

IT is not unusual, when a new journal is launched, for its sponsors to put up some kind of platitudinous apologies for intruding it upon an apathetic or careless public to beg, as it were, permission for the new venture to walk along its chosen track in the broad free Inky Way. "Jarrah," however, is not in apologetic mood. It has no need to be, for the propaganda which is its *raison d'être* is conceived in the public good—that and nothing more. The mag-

nificent forest heritage of Western Australia has been sinfully misused in the past, and those charged with its care and protection, those whose duty it has been to see that the heritage was handed on to posterity in at least as good a condition as it came to them, have often only been but dimly conscious of the weight of their responsibility. In some quarters, official as well as unofficial, there are now signs of an awakening, and evidences of a quickening of generous impulses towards the national forest wealth. It will be the business and the privilege of "Jarrah" to assist in completing the awakening process and to foster the nascent impulses towards a truer realisation of all the existing forest situation involves.

But why "Jarrah"? It is true that this State's forests contain many excellent timbers besides jarrah, but it is equally true that when our forests are mentioned either at home or abroad the name of their greatest representative instantly leaps into the minds. Jarrah and Western Australian progress are indissolubly linked together. For over 60 years jarrah was to all intents and purposes the only missionary that left our shores to work in the market mission fields of Europe, India and South Africa. Other reasons might be adduced for the name of this journal, but what has been stated must suffice.

In every other State in Australia as well as this, the forests have been cruelly misused. That depressing fact is now very generally recognised and steps are being taken to remedy past errors. New South Wales for instance, has adopted a very excellent Forest Act, which will prevent unwise exploitation in future and conserve and increase the national forest asset. Western Australia needs such an Act badly. The potentialities latent in the forests of Western Australia are as yet but partially understood. The war, however, has taught us many things, and one of these is that if Australia is to become strong and powerful, its people must in the future rely more upon their own resources than they have done in the past. Hitherto our forests have produced only raw timber for export and for house building at home. It will be necessary to extend the uses to which native

timbers have been put, by finding new avenues of employment for them. But at this juncture what our forests require as much as anything else is public appreciation of their value. "Jarrah" has been established to assist in creating that appreciation by directing attention to the possibilities within the forests and what they mean to the country. The League, although reborn less than a year, has already secured a marked degree of public approval, and this encourages the committee to proceed with the good work. The deep-rooted and quite erroneous opinion that our forests are inexhaustible must first be eradicated. When it is clearly understood that the national timber asset is diminishing to a dangerous degree, public opinion will demand that proper remedies be applied. "Jarrah's" purpose is to assist to that end: to help in the formation of a national forest conscience.



MANOEUVRING A BIG LOG AT FOOT OF HILL.

## The Minister for Woods and Forests says "Good Luck to 'Jarrah'!"

I HAVE been asked to say a word of God-speed to "Jarrah"—the official organ of the Australian Forrest League—and I do so with the sincerest pleasure, for the matters it will deal with are those in regard to which I have particularly warm feelings. The League has not been very long in existence, but it has already justified itself, and this journal is only another form of expression for its endeavours on behalf of our forests. The people of Western Australia are fully alive to their own interests in most things that concern them, but when it comes to the State's forests they exhibit a singular apathy that is hard to understand. It is putting no undue strain on language to say that until the time when gold was discovered this State was known to the world, outside of Australia, by its timbers only. It is little more than 30 years since the good people in the Eastern States discovered that timber grew in this State, and became aware that we had timberlands which deserved to be dignified by the name of forests. This happy discovery was made through the energy of certain patriotic and enterprising West Australian citizens, who despatched to the Great Exhibition at Melbourne some very fine specimens of our timbers.

If one may judge by the flattering reports which appeared in Eastern papers at the time, our timbers were something of a revelation to the dwellers in Victoria and New South Wales. But years before the date of the Melbourne Exhibition there seems to have been in Perth a little coterie of citizens who, with keen vision, foresaw the potentialities latent in our forests. These enthusiasts determined that the world at large should be made acquainted with the kind of timber we grew here. They were fortunate in finding a hearty sympathiser in Governor Weld, for in 1871, His Excellency addressed a despatch to the Secretary for the Colonies of the day (the Earl of Kimberley), which dealt exclusively with West Australian woods. Specimens were sent at the same time to the Admiralty

and to Lloyd's Register of British and Foreign Shipping. The outcome of the representations then made was that jarrah was placed upon the Admiralty List of timbers suitable for shipbuilding and it was also included in Lloyd's List of timbers that might be used for that purpose. Another and more important result of that action is reflected in the export returns of Western Australian timber. In 1873, according to the official table, 1363 loads were exported; two years later this figure had more than quadrupled and the increase ever since has been steady up to 1913, the last year before the war, when 272,397 loads were sent away. Up to the end of 1915, timber had left our shores to the value of £14,322,845. I quote these figures by way of impressing upon my readers some faint notion of the part our jarrah and karri forests have played in the development of the State. But if our forests had much to do with the early economic growth of Western Australia I am of opinion that they are destined to hold a still greater place in our onward march in the future.

The people of this State are just awakening to the fact that timber is not an annual crop like wheat; they are beginning to realise that the time which elapses between the young shoot and the matured tree measures in many cases more than the span allotted to man. And having reached this conviction it is becoming apparent to most of our citizens that the old methods of wasteful exploitation based on the utterly fallacious belief that our forests are inexhaustible must be abandoned. It is one of the principal objects of the Forest League to spread sound notions about forestry; to point out that wilful waste to-day will make woeful want to-morrow, and to suggest means for conserving what still remains of our forest heritage. The Eastern States in this matter are much more alive to the dangers of the present situation than we are here, New South Wales, for example, has made up its mind that the forests of that State are not for the benefit only of the people now living, but are a sacred trust to be used but not abused, a trust which must be handed unimpaired—improved if possible—to those who come after. To enable this to be done efficiently and in the most economical manner the Mother state

has put upon her Statute Book a Forest Act, which gives excellent promise of attaining the end desired. Queensland is moving and so is Victoria in the same direction. To bring this State into line, I have had drafted a Forest Bill which I hope to place before Parliament at an early date. For some time past the Forestry Department has been carrying on a campaign of education with the object of arousing interest in Forestry and in this it has been admirably seconded by the Forest League, and this journal is but another evidence of the League's desire to go on widening and completing that education.

When the present disastrous war is over the demand for timber for the re-building of the devastated areas in Belgium, France and elsewhere will be enormous. The beautiful and extensive forests of France have been sacrificed to the needs of war, the same may be stated of those of Belgium, and in the reparation of these countries, those controlling the work will have to call upon the forests of other nations for supplies. Some months ago, M. Alphonse Mathey, Chief Conservator of Forests, Dijon, France, paid us a visit. He was enthusiastic over what he saw in our forests and from the fact that the French people prefer hard to soft woods in their buildings, he prophesied a big market for our woods in his country. America and Canada have agents in the field already, and I trust that Western Australia may improve the opportunity by sending a representative there in time to get a share of the trade. In the immediate future, too, I look with confidence to seeing ships of wood under construction in this State. Western Australia built sea-going vessels half a century ago; there is no reason why they should not be built to-day.

"Jarrah" is, its conductors tell me, in no sense a scientific or technical journal. It is intended for popular use, and has no other object than that of interesting people of this State in their own forests. I hope that it will win a place in public favour—a place as definite as that which the forests it seeks to serve holds in the national economy.

R. T. ROBINSON,

Minister for Woods and Forests.

Perth, April, 1918.

## Tree Planting in Towns.

(By Alfred Carson.)



I WRITE, not as one having authority but, literally, as a scribe. My knowledge of forestry, as such, is that of the man in the street. So far as the science is concerned, I am an ignoramus, but I am an ardent lover of trees, and could fain wish that that affection were shared by a larger number of my fellow citizens. If it were, surely the Forest League of Western Australia would possess a longer membership roll that it can now boast of, while certainly a wider and a deeper interest would display itself not only in the preservation and more extensive economic use of our native timbers but in tree planting generally, alike for utilitarian and aesthetic ends. The average townsman thinks little and probably cares less about problems of forestation and afforestation. He does not realise the potential wealth of our timber resources, which are capable of being perpetuated, and which are part of his own rich heritage. This, doubtless, is due in part at any rate, to his not having seen a Western Australian forest in being, or, what is even better calculated to impress the thoughtful mind, a Western Australian forest in process of destruction—destruction too often more or less wanton. What is written on these matters in the newspapers—and a good deal is written concerning them from time to time—he reads but heeds not. He is not roused. His imagination is not touched. The fact is he fails to visualise the one or the other. Hence the great body of inertia which remains to be overcome before the urban population of the country will come to a right appreciation of the importance of forestry to our national life. I take it that the purpose, the main purpose, of the publication of "Jarrah" is to achieve something in this direction, and that the experts who are contributing to its pages, will, all of them, be writing with that as their objective.

What can I, a mere layman, do to the same end? That is the question that I have put to myself, and it has occurred to me that the opportunity might not unprofitably be availed of for entering a plea for a more general adoption of a municipal policy of



tree planting in and about the towns themselves. Let us have trees, and ever more trees, round and about us, and then, perhaps, our thoughts will more frequently turn to the value and the importance of trees in general both as a means of civic decoration and as a source of national wealth.

There is no thoroughfare no matter what its proportions or whatever its pretensions to architectural distinction, which does not derive an added dignity from the presence in it of an avenue of suitable trees, or even from a single row of trees down its centre. On the other hand, there is no street, however mean and dingy, that may not be in some measure redeemed from its ugliness and its sordidness by judicious tree planting. Might I not go still further and say that if our streets, before being built upon, were planted with pleasing trees, the owners of abutting allotments would hesitate before raising upon them ugly and mean tenements out of harmony with the landscape; for does not beauty beget beauty? St. George's Terrace of which we, as citizens of no mean city, are pardonably proud, would be more pleasing to the eye even than it is were it not bare of trees. Not its noblest buildings would suffer but rather would their loveliness be enhanced by a wealth of foliage in their vicinity. And, Money Street, otherwise humble enough in all conscience, has, with its magnificent double row of plane trees, become a thing of beauty and a joy for ever.

We have not always been happy in our choice of trees for street decoration. Some of our experiments have indeed been ludicrous in the extreme. Let me cite a glaring instance. About twenty years ago the City Council in a burst of tree-planting enthusiasm caused to be set up an avenue of citrus trees in the main block of the Terrace, between Barrack Street and William Street. These trees were protected by hordings and regularly tended and watered, but, as might have been expected, in spite of the meticulous care and attention bestowed on them, it was pathetic to witness their vain struggle for existence, their prolonged agony, inevitable decay and ultimate death. I am free to admit, and as a citizen am grateful for the fact, that the Perth City Council has not been altogether unmindful of its duty or its oppor-

tunities in the matter of street tree-planting. Compared with the sister capital cities of Australia, regard of course being had to its limited financial resources, Perth has done well, though it might have done better and ought to, and I believe will, do better in the future, inspired as it will be by an active and well informed town-planning association whose composition is not devoid of an element of artistic leaven. We have many streets and portions of streets arboreally adorned. But if I may venture to say so the planting of the Sugar Gum (*Eucalyptus corynocalyx*) has been somewhat overdone. The sugar gum, except as a comparatively young tree, is not nearly so ornamental as others of our eucalypts. The Red Flowering gum (*Eucalyptus ficifolia*) is almost, if not quite as easily established, does not assume such spread-eagle proportions and is more decorative, not only because of its denser and more pleasing foliage, but by reason of its superbly rich and profuse flowering characteristics. What have these gums done for the May Drive in King's Park? They have given to the natural beauty of this incomparable hillside a veritable crown of glory, and made it the envy and admiration of visitors and a perpetual delight to our own people. What would such an avenue not have done for Kings Park Road? It's show of Sugar Gums, fine no doubt as they are to-day, will, as the years pass, become ragged and gaunt if not absolutely ugly, or need to be subjected to regular and ruthless prunings back, operations entailing risks of partial or wholesale destruction and for long periods at a stretch robbing them of such native charm as they possess. Especially in streets along which telephone and electric wires run or are likely to run, the Sugar Gum ought to be pronounced tabu. It is not as if we had no better choice. The Red Flowering Gum might well, in some localities, have taken its place. Even the Lemon-scented Gum (*Eucalyptus citrodoria*) is in my judgment a much finer and handsomer member of the numerous eucalypt family. Although, like the Sugar Gum, it should not be planted where wires may be interfered with, it could elsewhere and with advantage be more extensively utilised. As may be seen from specimens at the Zoological Gardens and along the road to Karra-katta, this eucalypt is lofty and graceful and glories in a foliage so distinctive and

ornamental that one cannot but regret that it was not more extensively planted in the residential areas of the city and its suburbs in recent years.

Western Australia is passing rich in beautiful trees, but while some of them take kindly to transplantation not a few of the best will not adapt themselves to domesticated conditions. In this last category I would place the raspberry jam (*Acacia acuminata*) and its still more beautiful first-cousin the manna wattle tree (*Acacia microbotyra*) and the Quondong (*Santalum acuminatum*). Than these at their best, and in their native habitats—by the way all three are frequently associated in the wilds—we possess nothing in the way of trees, which, whether for flowers or foliage, are more strikingly attractive. Unfortunately as a rule they resent artificial treatment. They pine and die when segregated or when transplanted to soils that are unfamiliar, or if they survive they come lamentably short of realising the expectations of those who have seen them in their natural surroundings. This is especially true of the two first-named trees, which consequently may be considered out of court for civic adornment. Some of the eucalypts equally object to being placed in what is to them a foreign environment. The Salmon Gum (*E. salmopholia*) with its shiny umbrella-like top will not long survive if transplanted or even if left as a sole survivor of a bush clearing. The forest conditions appear to be an essential to its being. The Jarrah (*E. marginata*), the Karri (*E. diversi color*), the Tuart (*E. gomphocephalia*), and the Red Gum (*E. calophylla*) do not invite experiment. They are strictly wedded to their own conditions and to well defined physical and geographical limits. In a clay soil like Guildford, or in a rich red loamy soil, with a rainfall of between 20 or 30 inches, the Red Gum will flourish, but not otherwise. But the Red Gum, the Karri, the Jarrah, and the Tuart all grow to such a gigantic size that they can be left out of consideration where tree-planting in streets is concerned. Our own and other Australian wattles, indeed practically all the acacias—beautiful beyond compare in many respects as some of them are—are not to be recommended for street decoration. For such a purpose they have one fatal drawback. They may be advantage-

ously grown in extensive private grounds, but being as they are, comparatively short-lived they are not suitable for public thoroughfares, where longevity should be regarded as a *sine qua non*. Among the long-lived trees, native to the State and admirably adapted for street-planting, is the Peppermint tree (*Agonis flexuosa*) which has not yet come into its own. It belongs to the Swan River just as much as it goes to the South-West. In the early days it flourished in and around Perth, and might well be re-established along our noble river front, say, from the Causeway to the Mount. Visitors to Busselton cannot dissociate in their minds that popular seaside resort from the magnificent Peppermint trees which adorn its principal street, and which were planted something like 80 years ago by Dr Harris, the first resident magistrate of the district. The King's Park Board has exhibited both wisdom and good taste in planting recently several avenues of these lovely trees in that invaluable public reserve, where they are growing luxuriantly and offering an encouraging object lesson to the City Council to experiment with them in the city and suburbs. The native kurrajong (*Sterculia diversifolia*) for all its Noah's ark aspects—its hard and rigid conical lines—has its peculiar green colour and its symmetry to recommend it as well as its remarkable adaptiveness. Moreover it does not grow to a great size, and, like the native bottle-brush (*Calistemon*) does exceedingly well about Perth and is admirably suited for narrow streets. After all, variety is charming, and the most should be made of all our native trees that are suitable for street planting.

If we are to go further afield for ornamental trees, there are three that have especially appealed to me. They are—(1) The Camphor laurel (*Cinnamomum camphora*) of Formosa, a very queen of decorative trees as I regard it, largely because of its shapeliness and the rich tints of its autumn foliage; (2) the *Pittosporum undulata* (Eastern Australia), used at present almost exclusively for hedges, but most suitable for street planting as may be seen from experiments made with it at Guildford; and (3) the Carob Bean (*Ceratonia siliqua*) of the Mediterranean. The Carob is slow growing but very long lived, and is among the most handsome of exotic trees which have

been successfully acclimatised in Western Australia.

The foregoing brief observations are made without dogmatism. I have already suggested that I do not write authoritatively about trees. My remarks, however, are the result of many years' cursory mental-note-taking while going to and fro in the land, and are offered for what they are worth. If they provoke criticism so much the better.

And now by way of conclusion, I want to make a practical suggestion, not, I think, outside the scope of this paper. The citizens of Perth will, sooner or later, be concerning themselves with the question how they can best commemorate the part which Perth has taken in the great war. That being so, my suggestion is that such a memorial should take the form of a commemorative grove either in the city itself, or, somewhere in its environs. We have one large empty square, which might be dedicated to this great purpose and converted into a wood not inferior to the Fitzroy Gardens, which constitute one of the show places of Melbourne. Intersected by roads and parterres of flowers, Wellington Square, wooded as I see it in my mind's eye, with suitable trees, indigenous and exotic, would indeed be a fitting civic memorial of the war. If initiated by an Arbour Day, in which all the school children in the metropolitan area would be permitted and expected to participate, the occasion would linger long in the memory of the rising generation, while the grove itself would, besides being an adornment to the city, stand as an immemorial reminder to future generations of what they owe to their fathers who fought and died for them on the battlefields of Europe and Asia. And if, from these distant battlefields there were selected some of the trees to be planted—supposing them adapted to acclimatisation—the grove would be still more closely associated with the event it would commemorate. If a more ambitious scheme of the same kind should be desired, then some of the land lately acquired by the City Corporation between the city and the sea, might be utilised for the purpose.

There is no reason why some such project as I have adumbrated should be confined to the city. Similar schemes might be carried out in the country towns. And the subsidiary object—yet hardly a subsidiary object—of all of them would be to stimulate

public interest in trees and tree-planting, and—as it is not a very far cry from street tree-planting to forestry—to excite popular concern for the preservation of the forests we have and an ambition for creating new ones.

## Forestry in Malaya.

(By Hon. Walter Kingsmill, M.L.C.)

**I**N the development of any branch of lating and stimulating such de- usually accepted methods of regu- munity, one of the most useful and industry or science new to a com- velopment is by taking advantage of the guidance and information afforded by the experience of other countries in similar directions.

Although the circumstances of the countries so compared may be widely and even fundamentally different, still valuable lessons can almost invariably be gained from a study of the results attained and of the processes which have brought about such results. Thus, though we have not in our State of Western Australia, in spite of its wide variation in climate, forests in any way resembling those of Malaya (by which term I refer more particularly to what are known as the "Federated Malay States"), yet the short study I was enabled to make of their methods and results during a recent visit to that country, may not be without interest.

In the first place those of our community who believe in the economic importance of the proper care and development of our forest resources cannot fail to have that belief strengthened by the progress which has been made by the Department of Forestry of these States during its short existence. Far as we are behind this country in the organisation of a Forest Department on sound scientific lines, it seems strange to find in the report for 1916 of the Conservator of Forests, published in Kuala Lumpur, frequent allusions to the fact that they in their turn regretted their incapacity to keep pace with the United States, who established in the Philippines a Department of Forestry, at about the same time that the subject first claimed the attention of those administering the F.M.S. This serves to emphasise our backward position.

The forests of Malaya may be taken as co-terminous with the country itself,

as the area of clear land in the 50,000 square miles contained in the four States of Megri Sembilan, Pahang, Selangor and Perak, comprising the Federation, is even at its present stage of development, negligible.

The whole surface of the country consisting as it does of occasional plains with ranges rising in places to a height of 7,000 feet, is clothed with jungle more or less impenetrable, from which rise at intervals the forest trees of many species which supply the enormously valuable timbers and other forest products which contribute largely to the wealth and prosperity of the community of 1,037,000 people of all nationalities inhabiting these States.

In Western Australia the variations of soil and rainfall from the coastal districts inland have produced the effect of fairly definitely dividing our forests into belts in which one class of forest tree predominates till its place is taken by another to which the changing conditions are more suitable.

This characteristic is not nearly so marked in Malaya, nor does even change of altitude from the low-lying jungle of the coast lands to that clothing the mountain sides produce as much change in the species comprising this dense growth as one would expect. Immediately adjoining the coast large areas are occupied by mangrove forests, and it is interesting to note that this tree, despised in Australia, forms a most remunerative asset in this country. The exploitation of the mangrove or "bakau," as the Malays term it, is well systematised. Reserves are leased, and cut on a 25-year rotation; that period being deemed sufficient for reafforestation in which nature is aided by the department, either by sowing seeds or planting seedlings. The timber is used for building, yielding poles of most desirable timber up to 30 feet in length, with a diameter up to 12 inch, and also and more largely, for fuel. The areas, known as "coupes," allotted during 1916 amounted to 13,570 acres, from which the net revenue to the Department, after paying all costs, amounted to 108,133 dollars, equal (at 8.57 dollars to £1) to £12,618, which I think may be regarded as a most satisfactory result. The method of leasing, though varying slightly in the four States, is generally by a rent per acre, arrived at by tender, and in addition a royalty per ton of poles and of firewood cut.

Where planting is carried out, the spacing between trees varies from 4 to 6 feet.

The firewood is used on the railways, where it temporarily takes the place of coal, the supply of which is uncertain; by the mines where machinery is employed, and also for domestic purposes. Two species of mangrove are used *Rhizophora mucronata* and *Rhizophora conjugata*.

In the forests further inland an almost confusing variety of timbers is encountered. Amongst the most prominent of the hard woods are "Chengal" (derived from two species of *Balanocarpus*), a somewhat light coloured timber used largely for sleepers, and lasting well underground; Merbau (*Azelia*, sp.), much resembling our jarrah in appearance and utility; and Resak (*Shorea barbata*). Of these three timbers there were cut during 1916 88,000 sleepers, weighing over 4,000 tons, which returned to the Department a revenue of about £2,000. Other hard woods not perhaps so extensively used are Tembusu (*Fagroea fragrans*) and "Balau" (*Shorea*, sp.).

Of forest trees yielding soft woods, there are several varieties, most of which are known for trade purposes as "Meranti," which seems to be almost a generic name for timbers both red and yellow in colour, obtained from several species of *Shorea* and *Hopea*. These are valuable soft woods, and at one time were used to some extent in the North-West of our State, under the name of "Singapore Cedai" or "Pune." This timber, although not totally white-ant resisting, is less liked by these pests than some of our own hard woods; but of course in common with most soft woods, is very susceptible to climatic conditions, and is only used where protected from the weather.

The trees from which all the above-named timbers are procured are, generally speaking, of great size, and fine appearance, though not of course equalling our Karri in either respect. This is particularly the case with one or two species of *Shorea* and with Merbau. The usual method employed in milling the timbers of the F.M.S. is primitive in the extreme, practically all the sawing being done by Chinamen, working single-handed on the sections of the log brought in with water-buffaloes as tractive power, after the tree has been felled. The whole saw milling outfit can be readily shifted, and I understand that the tendency is for the sawyer to go to the tree rather than for the tree to be hauled to the sawyer. Nearly, if not quite all of the forest trees in the jungle, are characterised by the possession of highly de-

veloped buttresses, extending up the trunks from the roots for several feet, also by roots which have a great tendency to run along the surface of the soil, so that they may in many instances be traced for considerable distances. In addition to the production of timbers, some of which are above alluded to, these forests yield other products of interest, among which are several gums (known as "dammar"), gutta percha, some inferior wild rubber, and canes (known to us as rattans, the proper Malay name of which is "rotan"), as well as "atap," or thatching material made from the foliage of several species of palms. The "dammar" or gum used principally for the manufacture of various sorts of varnish is derived by tapping several species of trees; the most valuable, known as "mata kucing," which being interpreted signifies "cat's-eye," being obtained from a species of *Hopea*. This industry has declined of late years through the absorption at comparatively high rates of pay of all available labour on the rubber plantations. Gutta percha, which now I understand is only used in the manufacture of submarine cables, is obtained from a tree the scientific name of which is "*Palatium obovatum*," known to the Malays as "taban." The demand for this once much sought for article is not now very great. The wild rubbers, which seem to exist in all tropical countries, are not wanting in this; but are not seriously considered, as the Para rubber (*Hevea braziliensis*) introduced from South America is exclusively used in the production of the rubber which forms the principal export and source of wealth of those States, and which has dwarfed the importance of all the other industries carried on in this country. The export of canes used for furniture making and a great number of other purposes has fallen off very materially through lack of export facilities, and also through the tendency of the cane-getters to gravitate to the rubber estates, but even now in Singapore and neighbourhood there are always to be seen huge bundles of "rotan" soaking in the streams by the roadside, prior to being cleaned for use. These canes are produced by several species of palms, all of common occurrence in the jungle, which starting as a palm of ordinary appearance send out these long feelers climbing and creeping through the scrub and covered as they are with an intensely spiny and prickly skin, offering an altogether superfluous discouragement to travellers along the narrow

paths which are by the expenditure of a very large amount of labour, cut and kept open through the dense thickets of undergrowth.

The "atap" or roofing material above mentioned, is obtained principally from the "nipah" palm, which leads an amphibious existence in the mud of the river banks and sea marshes, and which much resembles in its appearance our "Zamia." Another source of this supply is the sago palm, and in the case of this plant it is found much more profitable to cut its foliage for succeeding years than to destroy it in order to obtain the sago contained in its trunk; as a matter of fact a very large proportion of the "sago" of commerce is really obtained from the tapioca plant; which is very extensively cultivated in these States. All the above products, in addition to many more with which I have not sufficient space to deal, return revenue to the Government through two channels; first, by the license fees and rents charged for permission to cut and to occupy land, and secondly by export duties, which are payable on practically all the articles either vegetable and mineral sent out of Malaya. This system of taxation has helped to bring about the result achieved under the efficient rule of this Government without politics of administering a country where all the public utilities such as roads, bridges, railways, etc., are paid for out of revenue alone, and of rendering the community free of public debt.

At the time of my visit I found that the administrative staff of the Forest Department consisted of no less than thirteen responsible officers, highly trained men most of them, from India, who directed the operations of quite a small army of rangers, forest guards and minor officers. What will eventually form working plans of the forests are in course of preparation by the combined efforts of the Forest and Survey Departments on the generous scale of four inches to the mile. The demarcation and classification of the forest lands is advanced every year, and the necessary settlement of forest areas is planned and decided. One of the difficulties of the Government is to induce the population to grow enough rice for their own consumption and the forest officials are always keen to allot settlers suitable areas of "padi" country for this purpose. Another task which falls to the lot of this department to carry out is the cutting and preservation of paths for foot traffic through the jungle, and the provision, in conjunction with the Works

Department, of the necessary foot-bridges over the frequent and often flooded rivers which intersect the country. The importance both to the daily life of the inhabitants and to the revenues of the States of the Forest Department will be readily realised. Sylvicultural operations are conducted at plantations both experimental and commercial dotted about the country in a great number of places, and where possible and advisable thinning of seedlings and destruction of harmful trees, creepers (of infinite variety) and weeds is undertaken. The area of forest planted or improved by these methods totalled (at the end of 1916) 39,500 acres. The financial result of the work of the department during 1916, shows: Expenditure, 339,430 dollars, revenue, 576,573 dollars; giving a surplus of 237,153 dollars, or £26,505. In addition to the earning capacity of the department, there must also be placed to its credit the annual increase in value (difficult indeed to express) of the forest lands with which it is dealing.

It is regrettable that there are not better and more effectual means of bringing under the notice of those of our rulers who profess a lofty disdain for scientific forestry the results attained in this country by the efforts of a department which is continually complaining of lack of facilities to carry out necessary works, but still is so far ahead of ours in the provision of these very facilities. It will, I hope, be fully understood that I realise that in the officials of our Forest Departments in this and the other States of Australia we possess men who both in knowledge and experience are in no degree behind their confreres in Malaya, but under our much more highly developed political system in this country, I fear that the exercise of that knowledge and experience is greatly hampered, much to the detriment of our national prosperity. I feel that in the short and discursive description which I have given of forestry in the Malay States, I have been obliged to miss much important matter, but hope that even what is here presented may prove of interest and a stimulus to the scientific and systematic development of our undoubtedly great forest resources.

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Jarrah and Karri are on the Admiralty and Lloyd's Lists as timbers suitable for shipbuilding.

## Forest Products.

(By Professor A. D. Ross, M.A., D.Sc.,  
F.R.S.E., Vice-Chancellor of the  
University of Western Australia.)

THE great war has had one beneficial effect in making our nation realise the importance of the alliance of science and industry. Germany acquired much of her power and strength from her determination, during the past third of a century, to have the work of the individual primarily work for the State. Her industries have been instituted and nurtured for the use of the State, and so at every difficulty scientific assistance has been forthcoming.

In recent years the value of our forests as State assets has been to some extent recognised, but even yet we do not appear to be sufficiently alive to all they may mean if properly developed. The formation of a Commonwealth Advisory Council of Science and Industry has, perhaps, helped to draw some attention to this matter, but unfortunately the work—nay, the very existence—of this Council is unknown to many who ought to have a living interest in our forests and their products. In Australia in particular, there is great need of scientific investigation of forest products. The vegetation of the Commonwealth is to a great extent peculiar to this continent, and the natives have not used the indigenous plants to the large extent which had obtained in other countries when they were first opened up to European commerce. We have thus good reason to believe that the institution of forest products laboratories may result in the discovery of oils, drugs, dyes, and other valuable vegetable products which may ultimately prove of considerable value. Let us glance briefly at some of the problems which at present are calling for detailed and scientific investigation.

At the present time we have not sufficient knowledge as to the various uses of our many Western Australian trees, and the best means of treating and seasoning each variety for such specific purposes. This is especially true in connection with the employment of timber in engineering structures. In such investigations it is necessary to mate the forester with the mechani-

cal engineer, and to discuss the treatment of the timber in the hands of the former with the results obtained by the latter with the testing machine. The importance of such work is not to be over-estimated, and it is a matter for congratulation that it is now in hand in Western Australia.

Another urgent problem is the investigation of products to be obtained from local timbers by the process of dry distillation. Owing partly to our forests having received in the past little of that care which it is hoped to give them in the future, a large part of most trees is valueless at the timber mills. Apart altogether from the rejection of the limbs and branches, there is—as has been stated by Mr. C. E. Lane-Poole—a loss of 53 to 67 per cent. in the case of sawing timber from jarrah and karri trees. At present a large proportion of this wood is merely burnt. Possibly a good deal might be done in using portions in the manufacture of small articles such as tool handles, vehicle parts, etc., which we now import and on which we pay duty. There will still remain a large amount of timber which will be of little value unless treated by distillation for the production of acetic acid, tar, methyl alcohol and charcoal. Unfortunately there has been only a very limited demand here for these products, but it is a question whether the demand will not increase in time with the development of commerce between Australia and neighbouring countries.

The problem of the utilisation of waste timber has suggested the possibility of the manufacture of wood-pulp for paper-making. Such investigations as have been made so far would indicate that our woods are not particularly suitable for this industry. At the same time there is every reason to believe that in the future we shall have over the whole world a shortage of paper-making materials unless steps are now taken to meet the want. With the good rainfall and the warmth of the South-Western part of this State, we might well plant and grow suitable trees, and so provide—as America is now doing—a valuable asset for our country in the next generation.

A last example of the work to be done in connection with forest products may be taken from the tanning industry. Two species of wattle and the mallet have provided considerable quantities of tannin for

Australia in the past. Now Natal has a valuable wattle-bark industry developed from trees imported from South Australia. Surely Australia should be able to take an important share in such an industry. In this same connection there is also an interesting field for investigation in connection with the use of the Red Gum kino in tanning. It is understood that the Germans had elucidated the secret of decolorising this gum, and with properly directed research we might well re-discover it. The use of the kino instead of tree-bark is important, as the tree is not thereby killed, and so the rapid extinction of the revenue-producing timber—as in the case of the wattles and the mallet—is avoided.

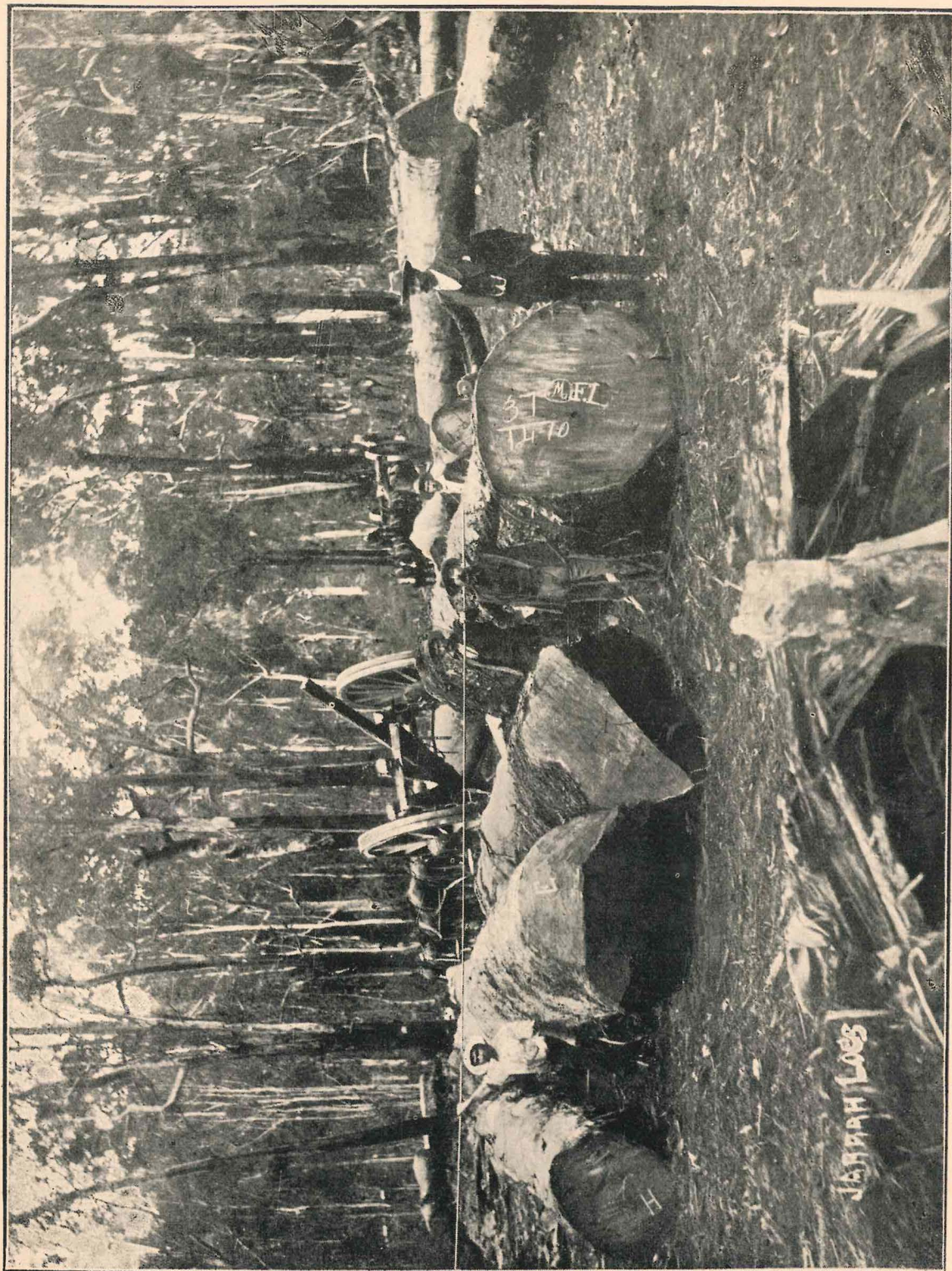
These few points will indicate the great advantage of scientific forest-products laboratories and the necessity for the prosecution of such work in our State.

## The "Shipworm" and the Timber of Ships and Jetties.

(By Professor Wm. J. Dakin, D.Sc., of the University of Western Australia.)

**M**OST people interested in timber or in ships have heard of the ravages of the shipworm, even if they have not seen the hardest of woods riddled by their burrows. They may have been told of the hundreds and thousands of pounds put into wooden jetties, and they may have seen the piles of those jetties extremely attenuated, or even broken, at about the level of the seas surface. Few, however, seem to have seen a sample of the animal carefully withdrawn from its long burrow. As a matter of fact this would require to be done immediately a piece of infected timber was lifted out of the water, for the shipworm is a delicate soft-bodied animal and soon dries and decays.

As popularly used, the term "shipworm" comprises certain animals which burrow into timber submerged in the sea or in the salt water of river estuaries. Scientifically the name is applied to an animal called *Teredo*, or to one of its allies—in the case of Western Australia it is a relation known as *Nausithoria*, which is responsible for our losses. Now these animals are not worms at all. That they should be called shipworms is not surprising, however, for the term "worm" is



JARRAH LOGS AT A BUSH LANDING.



often applied to animals which are anything but worms, although perchance they may be somewhat wormlike in appearance!

What then is the shipworm in reality? It is a mollusc, a shell fish not far removed from the pearl or edible oyster, and like these animals it has two shelly valves. The great difference between them is simply one of shape, the body of the shipworm is enormously elongated so that the shell only covers a very small part of it, whilst the body of the pearl or edible oyster is completely enclosed and protected by a strong shell. The shipworm does not use its shell as a protective cover or shelter for it is completely enclosed by the burrow in which it lies and in which it is compelled to remain all its life. It is not free to move to another burrow or to leave its own and take to the freedom of the sea, for, as it grows and becomes larger it burrows deeper and makes its newly excavated tube still wider to accommodate itself. The entrance to the burrow remains therefore much too narrow for the mollusc to leave, even if it had organs of locomotion. The burrow always remains open to the sea and when the shipworm is fully expanded, it stretches from one end of its home to the opening on the surface of the timber. The shell is at the blind end and it is here that wood boring takes place. Some food is obtained from the sea, and a current of water also washes out the waste matters produced as a result of life and at certain periods, the reproductive cells.

Now let us try and picture to ourselves what takes place beneath the surface of the sea at Fremantle, where many of the jetty timbers are inhabited by hundreds and thousands of *Nausithoria*, each one lying in its burrow. The shipworms are either male or female, and at some period of the year not yet known (perhaps the period extends over several months), the sexual organs will be ripe and eggs will be extruded, leaving the animals at the mouths of the burrows to float about in the sea. Large numbers of eggs may be present, some kinds of *Teredo* producing millions of them per year. The number of eggs produced by all the female shipworms of an extensive jetty (if the timber is badly infected) can scarcely be imagined! The fertilised eggs develop very rapidly and in a day or so a tiny shell will have been formed, but the embryo shipworm is quite unlike the adult in shape, and remains swimming about in the sea water for some time.

There is a gap here in our knowledge of the habits of the young shipworm for the next stage which is known, and which attacks the timber, is about a month old. When this stage is reached, the young shipworm is compelled to take up a new sphere of existence. It gives up its free swimming life to burrow into wood. It will be obvious that many millions must be unlucky, never reaching a suitable station for their further existence. They succumb—perhaps they are washed out to the depths of the ocean or swept by currents along great stretches of uninhabited coast—but nature in her prolific manner provides for this intense destruction. The duration of these tiny free swimming stages is long enough to enable new harbours to be reached and the shipworms to become common to practically all the seas. It must be understood however, that the early stages are quite helpless, and are merely driven hither and thither by tides and currents. The stage now reached crawls over the surface of a submerged piece of timber, seeking a suitable place of attachment. In all probability some depression or crack will be chosen, hence the double danger of other wood destroying parasites which attack perhaps only the surface of the timber and provide shelter places for the young shipworms, which now commence to bore into the wood.

One might well be surprised to find that the tiny young of an animal which is very delicately constructed even in its adult stage, could bore into hard timber. Shell fish just as delicate, however, are found burrowing into hard rock. In certain of these examples acid secretions are produced which dissolve the stone, but such chemical methods are not used by the shipworm whose only weapon is the shell. The two halves or valves are held in such a way by powerful muscles that they can be rotated backwards and forwards. By means of the foot the edges of the shell can be pulled up so that they scrape against the wood as they are rotated. The hard shell makes perhaps little impression on the wood, but it is well known that a constant drip of water will wear away stone, and the steady and continual scraping of the shell ultimately results in the shipworms long burrow. It is on record that a burrow 4ft. in depth was made in less than two years in the case of one of the American species. The shell itself is naturally worn away, but is replaced as rapidly by the animal.

There has been some discussion as to whether the shipworm uses any of the wood scrapings as food, especially since they are taken in by the mouth and pass through the intestine to eventually reach the end of the animal nearest to the opening of the burrow. There seems to be little doubt that some of the wood at least is digested, and in the West Australian specimens examined the liver of the animal was often tinted with the pink debris of the jarrah. This is an important point to be remembered when considering the usefulness of various wood treatments for the prevention of shipworm attacks.

Like all other animals the shipworm breathes, and to this end requires a constant current of seawater which enters the burrow and after passing over the gills of the animal leaves it again. Oxygen is abstracted from the water and waste matters, including the timber scrapings leave the animal with the outgoing current.

This is another point of some economic importance, for it will be seen that although securely sheltered, the shipworm could easily be affected by deleterious substances in the seawater.

A very short time elapses (a few months only) before the shipworm is sexually mature so that every facility is provided for the fresh infection of timber, and since the embryo stages are floating organisms, any piece of timber may be affected between the sea bottom and the surface. It is not necessary for the wood to touch the sea bottom nor to touch another piece which is already infected.

All kinds of timber seem to be attacked by the shipworm, and, from the fact that hard jarrah is burrowed deeply by the creature, it would appear that hardness of the wood is no deterrent, although naturally, progress would be more rapid in a soft wood.

Since hundreds of thousands of pounds have been lost in the jetty piles of this State alone, it will be obvious how important a question the prevention of shipworm attacks has become.

The damage has been greater still in America and the U.S.A. Forest Service has commenced a series of experiments in the preservation and treatment of timber. Now shipworm attack might be met in three different ways:—

1. The timber might be covered with some material which could not be penetrated by the shipworm.

2. The timber might be made unpalatable or even poisonous to the shipworm.

3. The shipworms might be poisoned in their burrows by substances added to the seawater.

It remains to be seen whether the lines of defence indicated in sections 2 and 3 are at all feasible, and at the same time economic possibilities. In some form or other the first method has been in use for very many years, and the use of copper sheathing on wooden ships must be familiar to all dwellers by the sea. An alloy containing 60 parts of copper and 40 per cent. zinc was patented by Muntz and used for this purpose under the name of Muntz metal. It has been also used for the sheathing of jetty piles. So long as the sheathing remains intact it is excellent, but the cost has to be taken into consideration when its usefulness is gauged.

(To be continued).

## A Forrest Policy for Western Australia.

(By C. E. Lane-Poole, Conservator of Forests, Western Australia).

HERE are many erroneous notions current as to what is meant by the phrase Forest Policy. A large section of the community would seem to think that it has for object the locking up of all agricultural land in forest reserves. Others, that it is another name for a mightily treeplanting campaign. We must plant two trees when we cut one down, is a common saying. Some would seem to think that it has for object the raising of timber dues so that the gentleman whose business depends on converting jarrah and karri into sawn timber pay more for the raw product. Another section, a very small one, I am glad to say, regards a Forest Policy as the latest dangerous fad of the century. In order to clear away any doubts on the subject I will attempt to explain what a Forest Policy really means.

In the first place let us look at Western Australia's milling timber resources. There have been many estimates of the acreage of forests in the State. The classification of the forests which has been proceeding for the past eighteen months has shown that most of these estimates exaggerated the extent of

our timber wealth. While at this early stage it is not possible to say definitely what the actual area is, it may be estimated as being not more than 4,000,000, and not less than 3,000,000 acres. Call it 3,000,000 acres and we shall be making a conservative estimate. Of this area very little yet remains virgin country. In fact the sawmiller and hewer in the past has cut over 1,300,000 acres, and no less than 1,500,000 acres are held under saw-milling concessions, leases and permits. The virgin country is contained in these allocated forests and also in small patches here and there dotted about the South-West. It will be seen then that the area of forest country comprises but an infinitesimal fraction of the area of a State which boasts 975,920 square miles within its boundaries. Let us now look at what these forests have done for us. Since the inception of the timber industry there has been cut and sold, no less than 5,530,000 loads of timber (3,318,000,000 super feet) valued at £22,619,000 and this is not counting the value of sandalwood, £2,576,000, and mallet bark, £874,000, which were obtained for the most part outside the main timber belt.

It would be thought that a raw product which has yielded over twenty-five millions to the State would be cared for in every way, and that land which is only suitable for growing timber would be reserved permanently. Instead of this, we find that of the 3,000,000 acres of forest, only 12,000 acres have been permanently reserved for the industry, and these lie within the Tuart belt and entirely outside the main jarrah and karri country. If no permanent reservations have been made it would be hoped at any rate that some work would have been done in the cut-out and semi-cut out forests in order to assure a future supply of timber. Alas, this aspect of the matter is worse than the other, for not a penny-piece has been spent on the improvement of the forests. The money expended by the Forest Department since its inception has gone solely to defraying the cost of the collection of revenue and branding timber for export. Here are the figures:

Revenue since inception of Department	£579,272
Expenditure since inception of Department	£137,940
	<hr/>
Balance	£441,332
This sum of close on half a million pounds,	

instead of going back into the forests to make good the wastage of the cutter, has been engulfed in the Treasury. At this stage a comparison of the value of the more important primary industries and the expenditure of the Departments controlling them is of interest, showing as it does how the forests have been neglected:

	1913.	£
Export of Wheat	763,798	
Export of Wool	976,818	
Export of Forest Produce	1,183,447	
Production of Gold	5,581,701	
Production of Coal	153,614	
	1913.	£

Department of Agriculture and Industries	126,311
Department of Lands	77,557
Department of Forests	12,093
Department of Mines	236,232

What business in the world could stand a system of management which aimed at taking all the profits and putting nothing back to consolidate, and improve the business and assure its future. Here is the most permanent and certain of all the primary industries, one which, under proper management will be yielding its timber in increased, not diminished volume long after the last ounce of gold has been won from the earth, treated as of no importance and allowed to starve for lack of a sound forest policy.

The Forests of Western Australia are not the property of this generation alone, but of all future generations. We have a right only to the timber that will grow during our life time, and it is our duty to hand the forests over to posterity, not only undiminished in area, but also improved in quality. We may cut the interest, but the capital must remain intact. It is the object of a Forest Policy to achieve this end.

THE FOREST POLICY.

These are the main principles:—

1. Demarkation and permanent reservation of the prime timber country.
2. The regulation of the cutting of timber so that only that quantity is cut annually which can be replaced by the natural growth of the forest.
3. The improvement of all cut and semi-cut out areas with a view to assuring the regeneration of the best species for future cutting.

In addition to the above, which form the

foundation of all forest policies, Western Australia, owing to her lack of soft woods, must include a fourth:—

4 The formation of a plantation of pines by the planting annually of an area sufficient to supply the soft woods of the State.

Taking the above sereatum:—

1. Before the main timber belt can be demarketed and reserved, it is necessary to classify the country and find out definitely which is timber country and which is not, and here I should like to disabuse the minds of surveyors and agriculturalists of the erroneous notion that the forester wishes to lock up agricultural land in his forest reserves.

It is the object of the classification (a work which is already begun and which is being carried out by mixed camps of foresters and surveyors) to find out which land is suitable for permanent reservation and to exclude land on which the growing of crops, etc., would prove more profitable. Except to secure mill sites, rights of way for tram lines or water rights, the forester does not want an acre of agricultural land. Once the classification is finished, the demarkation may be effected and the permanent reserve constituted. This is the first step.

2. The regulation of the cutting of timber and its restriction to that quantity which nature will replace in our life time; an essential condition, if the timber industry is to continue. In the oldest of our timber concessions where milling has been carried on since the seventies, it has been found that the miller can work back over his old cutting sections after 20 to 25 years. In other words it takes about a generation for timber too small for milling purposes, and therefore passed over by the faller, to reach a marketable size. With a view to determining more accurately the rate of growth, both in diameter and height, measurements of trees have been taken on a number of sample plots in the Jarrah and Karri forests. In the meantime, the above figures may be taken as approximately correct for Jarrah. It is clear that if we have an area of 25,000 acres of Jarrah and we cut out 1,000 acres every year at the end of 25 years we shall be back at the first section, and will be able to begin again. It is on a principle such as this that all the great forests of Europe are worked, though in some cases as in the oak forests of the centre of France, the revolution, or interval between the two cuttings, is as much as 150 years.

3. The improvement of the cut out and semi-cut out forests: The importance of this work will be clear to all bushmen, the virgin forests of the State consist largely of over-mature dying trees. A virgin forest grows at the rate that the old trees die. The miller only takes the good trees and leaves the bad ones behind. These die very slowly, and, during the process, prevent younger trees from growing up on the ground they occupy. It is quite possible, therefore, to return to the same piece of forest cut out a generation back, and find the country covered with old trees, and very few young ones fit for the mill. The disposal of these old ones, the regeneration of the young ones and the thinning of the poles where they are growing too thickly, is the duty of the forester as soon as the faller and miller have done with the area. His duty also is to organise a fire patrol during the dry months of the year, and so guard his young crop of seedlings, the forests of the future, from the greatest danger of all.

4. In the year immediately preceding the war we imported £177,000 worth of soft wood, all of which might be grown locally. An area of about a square mile would, at maturity, yield sufficient timber for the present soft wood needs of the State, in order that the supply may continue, it will be necessary to plant an equal area annually, so that once maturity is reached the revolution of the plantation is established, and the supply is perpetually assured.

At the beginning of this article I showed how bad had been the treatment of forests in the past, and at the end I have tried to outline a skeleton forest policy to remedy the mistakes of the past. There is one more point and it is as essential as all the foregoing principles: Once the forest policy is laid down it must be continued. Forest crops are not like wheat and oats, sown and reaped, in the same year. A tree takes so long to grow that a forester rarely sees the full results of his labours. If, during the life of the trees that form a forest, the policy is altered, chopped and changed, the result must be disastrous, therefore it is the first essential that there should be a continuity of Forest Policy.

This continuity of policy can only be established under the free Democratic Government which I hope this country will always enjoy, by awakening in the hearts of the people themselves a true consciousness of the magnitude and wealth of the forest assets they

possess. The Forest League has done much in this direction, and now that "Jarrah" is launched, I feel sure it will go a long way towards establishing and maintaining a sound Forest Policy.

### Our Timbers in Furniture and Decoration

(By A. Waterman, of Messrs. A. Waterman and Co., Furniture Manufacturers and Designers, Perth.)

I HAVE been asked to write a short article on Native Timbers of this State, as regards their value in the manufacture of furniture, and it gives me very great pleasure indeed to do so. All my life I have been associated with furniture, and during the twenty-five years or so that I have been in this State I have never ceased to urge, both by precept and example, the value of the Native Timbers as furniture woods.

Of our timber, Jarrah is the best known and most widely used, and although its virtues have long been recognised for buildings, road paving and railway sleepers, it is remarkable how little it has been appreciated as a furniture wood. I think I may claim to be the first to make use of it. Some twenty years ago I made a Louis Writing Table for Dr. Eaver. It has been nearly all over the State and when last I saw it a few weeks ago, it was as good as when it was made. Since then I have used many thousands of feet, and to-day practically all our best furniture is Jarrah. But Jarrah requires to be thoroughly understood, unless it is well seasoned and the boards carefully selected, it will not be a success, but I venture to say that with careful treatment there is no better furniture wood in the world. I am also using Banksia and Sheoak very largely. Both are excellent furniture woods, and they should be made accessible to the manufacturer—at present it is almost impossible to get supplies.

I have always maintained that we should not import a foot of timber for furniture, that all should be made of the woods with which Nature has so bountifully supplied us, and I have many times urged that all Government contracts should specify "Native Woods," and furthermore I am sure that if the qualities of our timbers were made known to the large furniture manufacturers at Home, there would be an immediate demand for them.

## The Australian Forestry Journal.

(By W. Catton Grasby, F.L.S.)

THE Australian Forestry Journal' for January is the first issue of a quarterly magazine on Forestry published under the direction of the Forestry Commissioners of New South Wales. The introductory article on "Forestry and the People" bears the signature of the Hon. W. G. Ashford, Minister for Lands and Forests of the Mother State, who states that "The 'Forestry Journal' is not intended to be a technical publication, burdened with highly scholastic articles and bristling with the phraseology of science which is little understood by others than the scientists. On the contrary, it is intended to be understandable by all people; to be instructive to the 'man in the street,' no less than informative and interesting to those for whom forestry is a profession and a business. Briefly the idea is to put before the public periodical bulletins of notes and news which shall cause those who read to recognise that forestry is worth while—that trees are worthy of attention, care, and respect. Living as a large proportion of Australians do, surrounded by trees, it is not surprising that they are regarded as of small importance, and the endeavour now is to steadily eradicate indifference, and in its place create a knowledge of, and interest in, the 'Great Australian Bush' which shall result in the growth of a spirit of ownership. If that can be achieved, the New South Wales Forestry Commissioners feel sure that they, and their confreres in equivalent positions in other States, will then receive that measure of support and individual and collective co-operation that is so very essential to the successful accomplishment of their mission."

The character of the articles so fully bears out the Minister's claim that it is not a technical publication, that one may suggest that in the desire to avoid scientific names the writers have missed excellent opportunities for educating the people and have made some of the articles of little value to readers outside New South Wales. In his paper read before the Perth Forestry Conference, Mr. J. H. Maiden, F.R.S., drew forcible attention to the confusion in the common names of Australian trees and

plants, not only in the different States, but in each State. He pointed out that such terms as red gum, flooded gum, blackbutt, and blue gum convey quite different ideas to people in the various States. Surely the "Forestry Journal" should endeavour to remove this confusion.

Among the articles is one of much interest on the "Murray River Red Gum," from which it appears that some 25 years ago the N.S.W. Government, to provide relief for the unemployed, established thinning camps on the river Murray. The thing was looked on at the time by many as the height of Government folly. In 25 years 41,970 pounds have been spent on 125,690 acres, or 6s. 8d. per acre. The value of the timber has been increased 300 per cent., and the forests are estimated to yield 10,000,000 super feet per annum, and the present income in royalties is £10,000 a year. Readers naturally like to know what tree is referred to, and it is carrying the idea of freedom from scientific terms to an absurdity not to teach the fact that the Murray River red gum is *Eucalyptus rostrata*. Similar comments might be made on such articles as "The Big Scrub," "Australian Hardwoods," "Our Vanishing Brush Forests," "Timber Tested for Value," and others. Such names as messmate, woolybutt, ribbon gum, and scrub box convey no meaning to those unfamiliar with the localities where the trees grow, and it would appear to be a wise thing to use the "Forestry Journal" as a means whereby Mr. Ashworth's "man in the street" may learn why botanical names are necessary, and, while doing so, enable the reader outside New South Wales to understand what trees are referred to.

In some of the articles this information is given. It adds very much to the note on "Drooping Sheoak" and its food value for stock in times of drought to know that if one wishes to obtain seed of the tree or look up a description of it, he must do so under the name of *Casuarina stricta*.

Few people in Western Australia and South Australia have ever heard of Hoop Pine, but all who are interested at all in ornamental trees know the striking appearance of the *Araucaria*, but do not look upon it as a likely timber tree. The writer on the Queensland Hoop Pine has made his article more directly interesting by the simple in-

roduction of the botanical name. By way of contrast the writer of the article on "Our Vanishing Brush Forests" has left his outside readers quite in the dark as to the identity of the timber trees he writes about in so interesting a way.

These criticisms are made with the kindest possible motive, in response to the appeal "Don't be Bashful" on page 9, wherein readers are asked to assist the Editor. In the same spirit one would record the thought, which occurred when first glancing through the journal and intensified as it was read carefully, that there appears to be a lack of definite plan resulting in a scrappy character, excusable, maybe, in the amateur production of a Forest League, but hardly commendable in a journal issued by a Government Department with the express object of impressing the value of the Department on the public mind. The objects of the Minister are so admirable that they must be considered the justification for being more friendly critical than would be the case if those responsible had adopted a stiff, super-dignified attitude. It is a pleasure to recommend the journal to the members of the Western Australian Forest League. Anyone who desires to subscribe should write to The Editor, "Australian Forestry Journal," c/o. N.S.W. Forestry Commission, O'Connell-street, Sydney and enclose 2s. in stamps.

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We acknowledge, with thanks, copy of an article by Joseph Brinker, reprinted from "Popular Science Monthly" of New York, and entitled "Wooden Ships to Save England." Wooden ship-building is having a most wonderful rebirth in America. The wooden vessel can be built more rapidly and at less cost than its steel sister, and therefore it seems likely that it offers the quickest and best solution for many of the present pressing ship-building problems.

\* \* \* \*

The peoples of Belgium and France exhibit a strong preference for hardwoods in building construction. There is a big market for Western Australian timbers when the devastated areas come to be rebuilt. Already America and Canada have commissioners on the spot pushing the woods of their countries, but Western Australia has, so far, no official representative. Will the Government let the opportunity slip, we wonder?

## Forestry and War.

(By Kingsley Fairbridge.)

WAR is as much a test of man's materialism as of his soul. During the past three years and a half millions of tons of British shipping has of necessity been earmarked for the purpose of carrying timber, and British statesmen have known that 75 per cent. of this shipping could have been used for other purposes had Great Britain chosen to protect and foster her forest resources. Before the war her imports of foreign softwoods amounted to over £20,000,000 per annum, and the Government had been assured by Sir William Schlich and others that practically the whole of the timber could have been grown in the United Kingdom. Colonials are apt to think that the old country has no land for afforestation purposes, and it may come as something of a surprise to know that over 3,000,000 acres are classed as "woodlands," while nearly 25,000,000 acres are classed as "mountain, heath, and marsh lands." A large proportion of the latter could be used beneficially for forestry, if the Government would bestir itself, while of the former some of the largest areas are so carelessly managed that the actual timber yield is relatively small. The major part of the British importations consisted of Scots pine, spruce, Weymouth, and silver fir, coniferae that would thrive (with the exception, perhaps, of spruce) on British waste lands under protection and proper methods.

Another and significant sidelight on the importance of organised forestry is contained in the, at one time frequent, reference in the war communiques to the German regiment of Jaegers. Detachments of this famous regiment of scouts were attached to other battalions, and commanded respect among the Allied armies by their deadly skill with the rifle. This skill was the outcome of a lifelong use of the eye and ear in the open country, for the "Jaegerbattalion" is composed entirely of forest officers of the lower grade.

Of still greater moment to a nation in time of war is the fact that forestry, by giving employment, confers upon the country an additional population upon which

the army may call for man-power. Take the case of Germany. The census returns for 1895 show that in that country 111,926 people had their chief employment, and 47,410 their partial employment in forestry work. Upon the former class 240,640 family members were dependent. In addition, 899,956 found their occupation in the timber industry, and the families maintained by these numbered 1,547,847 persons. Forestry, of course, affords less employment per area than does arable farming, but gives much more employment than pastoral land. In Germany, forestry is said to require only one man for every 308 acres, but, even on this basis, Great Britain, had she chosen to make use of her waste lands, would have had a reservoir of over 81,000 men directly engaged in forestry, upon whom she could draw for man-power; while, in addition, she would have had a further army of 660,000 men indirectly or partially maintained by her forests.

The position of Western Australia as regards the timber trade is wholly distinct from that of the mother country, but as regards the necessity for additional population it is identical. In future wars, unrestricted submarining, a means of embarrassing one's enemies that has undoubtedly come to stay, will, as at present, interrupt our export; but the more fully we have developed our forest industry the greater will be our supply of men for purposes of attack or defence. This statement by no means infers that we should remove restrictions on felling, but quite the contrary.

And lastly, I cannot help thinking that there are psychological as well as material benefits to be gained in war time from the practice of organised forestry. The patient foresight, the strict attention to detail, the necessity for method and economy that are imposed upon this great profession are habits that become of prime urgency when a nation is fighting for its life. The British nation is almost alone in its thoughtless disregard of the value of systematic sylviculture, and one sometimes wonders if we would have made such blunders as the initial errors at Gallipoli and the transport fiasco on the Tigris, had the leaders of our armies had the example of a methodical forest service at their elbows—as was the case with France and Germany.

## Mining Timber.

(By C. D. Ferguson, Forest Ranger.)

**F**AMOUS as our Goldfields are, and have been from a mining point of view, yet the Mining Industry would be sadly handicapped, were it not for the vast forests of Salmon Gum on our Eastern Goldfields. Without these Forests it would be almost impossible for mines to exist, for when one comes to consider that the engines feeding our great Goldfields through a mighty Water Scheme are fired or fuelled from our Goldfields Forests, and the hundreds of thousands of horse power necessary for the lighting of Kalgoorlie and Boulder, the driving of trams, and the vast machinery throughout the mines, is developed on wood fuel grown on our Goldfields Timber Areas, it must appeal to all as wonderful.

Salmon Gum (the chief of our Goldfields timbers) has of recent years completely taken the place of imported wood such as Oregon, which in the earlier days was used extensively throughout the Mines. At the present day all the timber necessary for shaft-timber, driving material, sets, props, lagging poles, and all stope material is Salmon Gum and Morrell. Up to the outbreak of the war there were approximately (quite apart from firewood) 3,000,000 super feet of Salmon and Morrell consumed annually underground on the Golden Mile alone. While the annual consumption of firewood was approximately 1,000,000 tons, employing about 1,000 men and 250 horses and drays. There are approximately 230 miles of privately owned railways, together with enormous quantities of rolling stock employed in transporting the firewood from the bush to the Golden Mile. The Government railways of course also handle the whole of the wood going through to the mines. The employees connected with the firewood industry are chiefly composed of Italians, Austrians, Slavs, and a small percentage of British subjects, who are chiefly employed as navvies or horse drivers. These people, speaking generally, lead a hard life, living in tents from year to year in a waterless land, and the country over which the operations are conducted, is not blessed with swimming baths or even picture shows.

The Government representative supervising the operations in connection with this indus-

try is the District Ranger—usually a dusty, sunburnt, withered up individual, who also lives a hard, rough, lonely life, and on his travels depends upon rock holes, native wells, etc., for his water supply. Often, after digging out numerous dead rabbits, hawks, lizzards, and parrots from an old native well, he will find sufficient liquid fuel for himself and horses to carry him over the next stage. His bed is usually the "Saltbush," and his roof the sky. However the life is a healthy one, and the sunburned Ranger is usually the healthiest and happiest man in the bush.

The firewood tramlines out into the Mulga (the vernacular term for the bush, which provides the firewood) in which the polyglot cutters find employment, also tap small belts of Sandalwood, but this valuable timber is now becoming scarce. Some of it, however, is likely to be got so long as the firewood railways continue to be pushed out. Western Australia's Eastern Goldfields are unique in one respect. Gold, through some unscrutable dispensation of Providence, is usually found in situations where supplies of firewood are either limited or non-existent. The reverse is the case in the Golden West. The timber necessary for the various requirements of mining is plentiful, and within easy range.

## Timber "Cruisers" in the War Zone

**T**HE term "timber cruiser" is scarcely known in Australia. It is of American origin and habitat, and signifies an expert whose business it is to survey woodlands, make plans of them and estimate the quantity of marketable timber of various kinds there may be in them. The "cruiser" who wants to shine in his profession must be a competent surveyor, have some knowledge of practical forestry, and must know timber values intimately. At the British headquarters in France is a staff of five "cruisers." Their duty consists of "cruising" throughout the country generally, and making preliminary reports and obtaining the particulars required by the Contracts Department. They have also to regulate purchases of timber. In search of suitable timbers they visit the remotest districts in Allied countries in Europe. These British Army timber "cruisers," before joining up, were engaged in the timber trade in England.



## Haulers and Haulers.

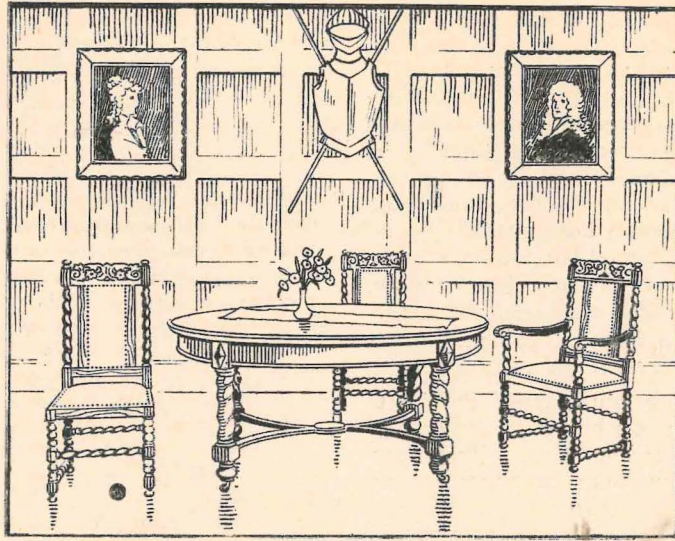
[BY W. C. THOMAS].

A STEAM loghauler does not stir one's imagination like a loghauling team. It has too mechanical a ring about it to arouse picturesque fancies. He who has gone into the forest and witnessed the teams at work has admired the display of strength, sagacity, and, with only occasional lapses, the unity of purpose of a team of six or eight sturdy horses engaged in transferring a big jarrah log to a landing. There is something about a team and the teamster that seems peculiarly "bushy" which one misses about the mechanical hauler, and where the mechanical contrivance is compelled to utilise a small team in some portion of its operations one feels it to be a sort of poetic justice like a horse bringing home a derelict motor car. But what the steam loghauler lacks of the picturesque it fully compensates for in the dramatic and sensational, and it has the satisfaction of knowing (if it were a sentient thing) that the inaccessible creek with its unwonted jarrah giants would remain inaccessible for ever as far as loghauling teams were concerned, and when it comes to question of the longevity of a milling camp, the continuity of a lumber enterprise, the substitution of steam loghauling for horse hauling becomes a matter of stern necessity.

But stand by for a while and watch them taking out the much admired and, for its diameter, mighty wire rope of nine over nine over one strands and half a mile in length rolling over the hauler drum with a musical rumble that sounds pleasantly among the forest glades. There is a running fire of orders, mostly difficult to understand by a stranger but a simple A.B.C. to those engaged in the operations. Sometimes they sound quite like yells and gasps, but the right thing invariably happens as the caller desires, and sometimes there are adjectives applied of anything but a neutral colour when things don't happen quite as they should. The way is rough and steep or steam hauling would not be the method of seeking those huge trees crowding the ravine. There is *debris* of trees already done to death and their sub-

stantial bodies taken away. The reddish earth that makes the stranger think of beautiful orchards and ideal homes, where the sprinkler would not need to coax life to drooping plants every summer evening, is churned up as if great blunt ploughs had gone over it with crazy ploughmen in charge—where, in truth, the huge logs had been dragged by the tough tenacious cable from its long habitat up over the hill to the landing, gouging out earth in a muddy billow when the weather was wet, or in a smothering cloud of dust when the weather was dry. There is the ever-growing *debris* and the stumps of great trees to avoid, and wits and experience and the bushman's intuition for getting out of difficulties ever arresting the stranger's attention, his admiration, his great wonder, for oftentimes it strikes one as marvellous that ever a way can be found amid so much disorder. Blocks and tackle here and there, advantage taken of a big stump to ease the load or manoeuvre the log as it slowly but surely comes up from its shadowy haunt into the brighter sunlit regions of the hill crest. And a warning every now and again from someone to "Look out!" as a long stretch of wire roap straightens out in a taut line of perhaps a hundred yards, which by any mischance breaking and flying your way would transfer you to "kingdom-come" without ceremony or pain.

Yonder goes a horse with a rope. They are linking up a log with the hauler rope. The head of the log is gripped by chains. It lies in a difficult position and will have to be dragged out by a nose block. The hauler rope is threaded through the block and secured to a tree stump away on the right. When the pull gets on hard the necessary leverage will take place and the log will have to yield its ground. A great deal of manoeuvring may have to take place before any appreciable progress is noticable, but it is rare indeed that a log, no matter what its girth or weight, is allowed to be abandoned. It contains too much valuable timber, to say nothing of the cost incurred in bringing it down, for that. So there is a pull and a slack and a bit of work by the men clearing away obstacles, a fresh pull and a slack, a series of heave-oh's! and whoas! long drawn out, a change of position of block and tackle,



## Jacobean Suite in Jarrah

Even now there are many people who do not realise the many uses of our local timber. Jarrah has an impressive beauty which all must admire, and it is particularly suitable for old-world styles such as Jacobean. The suite illustrated is in the Jacobean style, and it has been produced entirely in our West Perth Factory.

The ancestral homes of England owe much of their stately dignity to their old-style furniture. In nearly every room there is some reminder of distant romantic periods, and this Jacobean Suite is more than usually interesting because it has been copied from the furniture in an old mansion in the County of Kent, England.

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and so by degrees the stubborn log is forced to yield ground and come away. First this way, then that, in a wriggling snake-like manner the mass of potential sleepers and scantlings is forced away from its giant brothers, shearing and sizzling through the earth, or crunching over the remnants of other trees, until an hour or so after he was linked up to the hauler he begins to show his dusty nose over the brow of the hill and the man at the hauler knows that the tally has gone up eight or nine more loads.

The steam hauler looks anything but pretty or romantic but it is a most effective worker for dealing with trees that are beyond the power of horses to drag up precipitous and tortuous hills. The wire rope and block make a poor substitute for the old-time whim as a picturesque vehicle for the transport of the logs, but the element of danger surrounding them attracts one as does the element of danger about the flying trapeze artist or, to be more modern, about the aviator doing loop-the-loop acts, and perhaps one would prefer to watch the rope and block doing its work rather than see the more familiar horses and whim for, at any rate, it is a novelty in the W.A. bush.

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## In Lightsome Mood.

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### THE PERILS OF FORESTRY.

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From the "Western Mail," Perth, we clip the following. An abiding faith in the iron-clad veracity of the "Mail" is at once our reason and our excuse:—

"Toilers in Australia do not always appreciate as they should do the tragic disabilities attending similar employment in other parts of the British Empire. Take conservators of forests, for instance. In Australia when a conservator visits a forest he may, and probably does, meet a disgruntled timber hewer who is as full of growlings as a politician is full of guile, but he will not come face to face with a fierce sambar fitted with a perpendicular afterthought! The Australian forester when he sallies into his woodlands may, and probably does, come across an exhausted bullocky leaning against a tree and weeping bitterly over the disastrous poverty of the English language, but he will never come face

to face with a ravenous, man-eating tiger. In India, I am led to believe, the sambar and the tiger are deadly incidents in the forester's life. In an Indian journal devoted to forestry, I have just read the full particulars of an adventure a young and unhardened conservator had with both the savage beasts named.

The forester was visiting a clearing in a Sal forest, and with approving hand was patting the young sal-shoots, when, raising his eyes, he saw a sambar within a few yards, gazing hungrily at him. There being no tree handy the forester didn't climb it. The officer ceased thinking of the girl he left behind him and concentrated his attention on the sambar. 'Every now and then,' he writes, "the sambar hammered the ground with his hoofs and his tail stuck up at right angles and looked as if it had been dabbed on as an afterthought." A sambar is savage at any time, but when he has a perpendicular tail, it is up to any human in the vicinity to prepare for immediate dissolution. "Through a special intervention of Providence," continues the forest officer, "nothing happened. After looking me over for a little, the sambar lowered his danger signal and trotted off into the forest. He had, I fancy, recognised the service uniform, but he wasn't after me. I am young and slender, while the chief is old and fat. Apparently it was the boss the brute was laying for."

Plucking a handful of young sal leaves the forester wiped the cold sweat from his brow, and turned to leave the clearing. He immediately found himself gazing into the blazing eyes of a man-eating tiger! The position was critical, and the forester again deeply deplored the absence of a climbable tree. The tiger's tail, like the sambar's, was in evidence. But the tiger's afterthought wasn't perpendicular. It was being vigorously swished from side to side and was playing the deuce with the young sals within its reach. The officer opened his coat, to get out pencil and paper wherewith to write a few last words, when—but let the gallant forester tell his own story—"The tiger, I am of opinion, misunderstood my action. He thought, apparently, that I was about to give him a copy of the new forest orders dealing with the destruction of man-eaters, for, with a snarl of rage, he bounded off into the forest!" The intrepid man was saved! The story of the adventure concludes with these moving words, "I reached my camp and took out a bottle of Scotch. I do not mind confessing that my hand shook as I poured myself out a first-mate's nip." I can well believe it. The tiger shook the forester and the forester gave the bottle a good shake. The honors were easy. But I'd like to hear the opinion of the fat old inspector-general about the matter."

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“Twigs.”

THE British Air Board has been making enquiries in Australia as to suitable timbers for aeroplane construction. Western Australian woods are all too heavy so far as the bodies of air-machines are concerned, but in the matter of timber for propellers this State's forests have some woods which meet all the requirements.

Professor Tomlinson, of the University of Western Australia, recently completed at the Midland Junction Workshops exhaustive series of tests of Western Australian timbers. His results were made public in a paper read before the Interstate Forestry Conference in Perth in November last. The attention of timber-users (including the Department of Public Works) is directed to this valuable addition to our stock of knowledge regarding the physical properties of local woods.

Hidden away in various dusty repositories is a good deal of quaint information about the early concession times. A document dated 1886 mentions that “The Karridale Mill is now in full work.” One learns from it also that a builder of some reputation has just arrived at Karridale, with a large family, and so soon as he has completed a residence for himself, will build an eight-roomed house at Borranup for Mr. Davies.” But early Karridale seems to have been a place which did itself well, for it possessed “a large permanent tank, a stable eighty feet long by fifty feet wide, a large store and a ball room and a school.” Sunday, presumably, was the day set aside for dancing and decorous gaiety, for of a certainty the male portion of the population seems to have had little time for recreation on the other six days of the week if a dry-as-dust official report is to be believed. From it we gather that “the men commence work as soon as the day dawns and work till sunset. Some of the men work after hours, when a number of trees are cut into slabs, ready for the circulars at daylight and are earning from 30s. to £2 extra per month.” They, doubtless, could do with the extra cash, for the unskilled rate of pay was 6s. per day.

At Mahogany Creek, in the early days, the wages of timber workers was 4s. 6d. a day for 10 hours' work—that is for pit-sawyers. Teamsters and general servants 30s. to 40s. per month and board. Women as general servants 20s. a month and board. Split posts and rails were produced for 25s. per 100, split pailings, 4ft. 6in. to 5ft., about 6s. per 100; split shingles, 14s. per 1,000. Each faller and hauler paid 5s. per month licence fee, and was permitted to haul and cut as he pleased.

THE SONG OF A BANKSIA.

A PLEA FOR OUR NATIVE TIMBERS.

You pause to admire my polished wood—  
 “An exquisite piece of work,” you cry;  
 “The grain is fine and the carving good.  
 “There are no more like it; tell me why?”

Once I lived out in the distant bush,  
 Where the whispering breezes love to play;  
 I spread my leaves in the midnight hush,  
 And drew my strength from the golden day.

I grew in our Westland wide and free  
 Thro' winter stormy and summer long;  
 I was only a little straggling tree,  
 But my heart joined the birds in their triumph  
 song.

But a day there came that whispered of dread—  
 The echoes resounded with death-dealing blow—  
 In the interests of Progress our lifeblood was shed,  
 And many a noble tree laid low.

We were left to rot, or perchance be burned—  
 It must be done, we were in the way.  
 But an old man passed: to me he turned,  
 And struggling, dragging, he took me away.

There in his workroom many an hour  
 He split and modelled my slender frame;  
 As he carved and polished and showed his power  
 To bring our timbers their rightful fame.

At last in the opal sunset light  
 The finished frame he laid gently down,  
 And wedded me fast to a mirror bright.  
 Next day he carried us into town.

A lovely maiden besought the prize,  
 And tenderly stroked my polished grain:  
 The mirror reflected her glowing eyes,  
 But she clasped the wood to her breast again.

Pleasure and help! These may I give  
 Because of the man who knew my worth.  
 Remember our forests for that must live,  
 To serve the country that gave them birth.

—WINIFRED MAY.

Perth, April, 1918.

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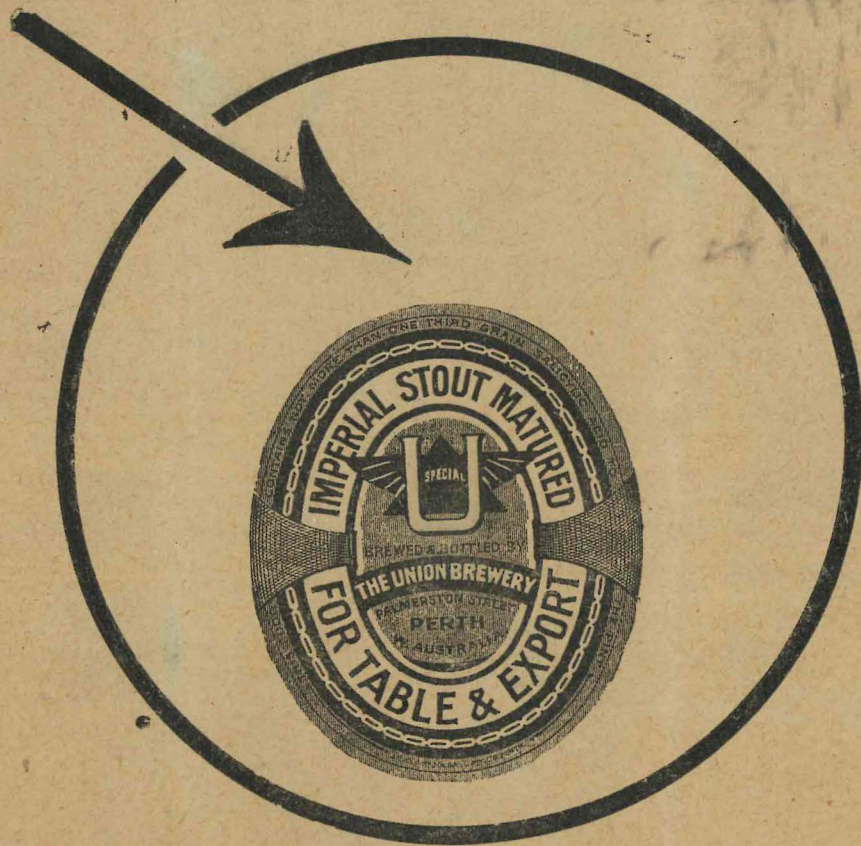
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